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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,965	10/27/2000	Naohisa Kamiyama	199153US2S	3176

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER

JUNG, WILLIAM C

ART UNIT PAPER NUMBER

3737

DATE MAILED: 03/28/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/696,965

Applicant(s)

KAMIYAMA, NAOHISA

Examiner

William Jung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 23-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Claims 19-22 and 26-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 5.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-9, 11-18, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Clark* (US 5,980,458) in view of *Averkiov et al* (US 5,833,613).

Clark discloses of the invention substantially as claimed in claims 1-9, 11-18, and 23-25. Regarding claims 1, 9, and 23, Clark discloses of an ultrasound system and method including a probe configured to transmit/receive an ultrasound wave to/from the subject (col. 4, lines 10-29; col. 6, lines 52-60), a transmission circuit configured to drive transmission of ultrasound wave sequentially changing the direction (phase) of the transmission line (col. 15, lines 18-65), a reception circuit designed to receive parallel line data, transmission and reception control to change number of parallel reception during a scan (col. 8, lines 13-43; col. 9, lines 33-60), and image processor for processing images based on line reception data (Col. 9, lines 3-12).

Regarding claims 3, 6, 8, and 24, Clark also discloses of long and short distance region reception line data according to the focal depth (col. 7, lines 7-24).

Regarding claims 7, 8, and 25, the direction and order of the sequence of the transmission are adaptable to any order including forward and reverse direction (col. 16, lines 17-35).

Regarding claims 2 and 5: Clark discloses of processing N-reception line (parallel and adjacent) to generate ultrasound data in short or long distance region (col. 16, lines 48-65).

Regarding claims 11 and 12: Clark discloses of transmission control circuit to change the voltage, size of a focal point, opening area (aperture), number transducer elements, and transmission frequency (col. 5, lines 10-37; col. 8, lines 51-59).

Regarding claims 13-15: Clark discloses of storage unit to store multiple slice or sector or segments of transmission region (col. 9, lines 3-12; col. 15, lines 18 – col. 17, line 15).

Regarding claims 16-18: Clark discloses of image processing unit to generate images based on reception intensity (col. 9, lines 3-126; col. 5, lines 37-55; col. 14, lines 21-34).

Regarding claims 1, 3, 4, and 6-9 Averkious et al discloses of the use of contrast agent introduced into the body can enhance ultrasound imaging, hence, the ultrasound imaging system and method such as Clark can be improved by contrast agent application. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to apply the teachings of Clark to the teachings of Averkious et al to achieve the claimed invention.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Clark* and *Averkious et al* as applied to claim 9 above, and further in view of *Dayton et al* (IEEE Ultrasound Symposium).

Clark and Averkious et al substantially disclose of all claimed invention in claim 10.

Dayton et al reported in IEEE Ultrasonic Symposium (1997) a method of microbubble destruction. Dayton et al disclosed two methods of microbubble destruction. First is the gradual

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gas diffusion from microsphere. This is the most common method of bubble destruction at low acoustic pressures is simply the gradual shrinkage of the bubble as gas slowly diffuses out. The acoustic energy incident on the microbubble enhances gas diffusion into the medium. Second is the rapid destruction of bubble: In the case of a medium to high acoustic pressure, shell material be expelled rapidly away from the core. Dayton et al demonstrates in extension of Averkiou's contrast agent (microbubble) application that the destruction of microbubbles to further alter the echogenic property of the contrast agent laden tissue r to rid of contrast agent. Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to apply the teachings of Clark and Averkiou et al in view of the teachings of Dayton et al in order to achieve claimed inventions.

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***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William Jung whose telephone number is 703-605-4364. The examiner can normally be reached on Mon-Fri 8:30 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin Lateef can be reached on 703-305-3256. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0758 for regular communications and 703-308-0758 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.

William Jung  
Examiner  
Art Unit 3737

*WCS*

March 21, 2003



Marvin M. Lateef  
Supervisory Patent Examiner  
Group 3700